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(71) Applicant: MITSUI TOATSU CHEM INC

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(54) MANUFACTURE OF SEMICONDUCTOR THIN FILM

(57) Abstract:

PURPOSE: To form a semiconductor thin film with superior orientation on a single crystalline or amorphous single crystalline substrate by photo-decomposing a mixture gas consisting of fluorosilane, silane or, desirably, hydrogen.

CONSTITUTION: A single crystalline or amorphous single

crystalline substrate whose surface is cleaned with washing or etching is placed in a thin film forming device 7 which has at least a light permeating window 1, a substrate holding means 3, a substrate heating means 4, a gas introduction means 5 and a vacuum discharge means 6, and the substrate is heated to 100W/400°C under vacuum discharge. The material gas is supplied to the said device, with the flowing ratio of silane to fluorosilane being 0.5W/50 and the flowing ratio of hydrogen to the fluorosilane being more than twice the former. As the fluorosilane, $\text{SiH}_4\text{-nF}_n$ (integer of $n=1\text{W}3$) or Si_2F_6 is usable. As the silane, monosilane, disilane, trisilane expressed with $\text{Si}_m\text{H}_{2m+2}$ (integer of $m=1\text{W}3$) are usable. As the III group compounds to be added to the mixture gas, dibolane (B_2H_6) is usable. As V group compounds, phosphine (PH_3) or arsine (AsH_3) is usable.

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